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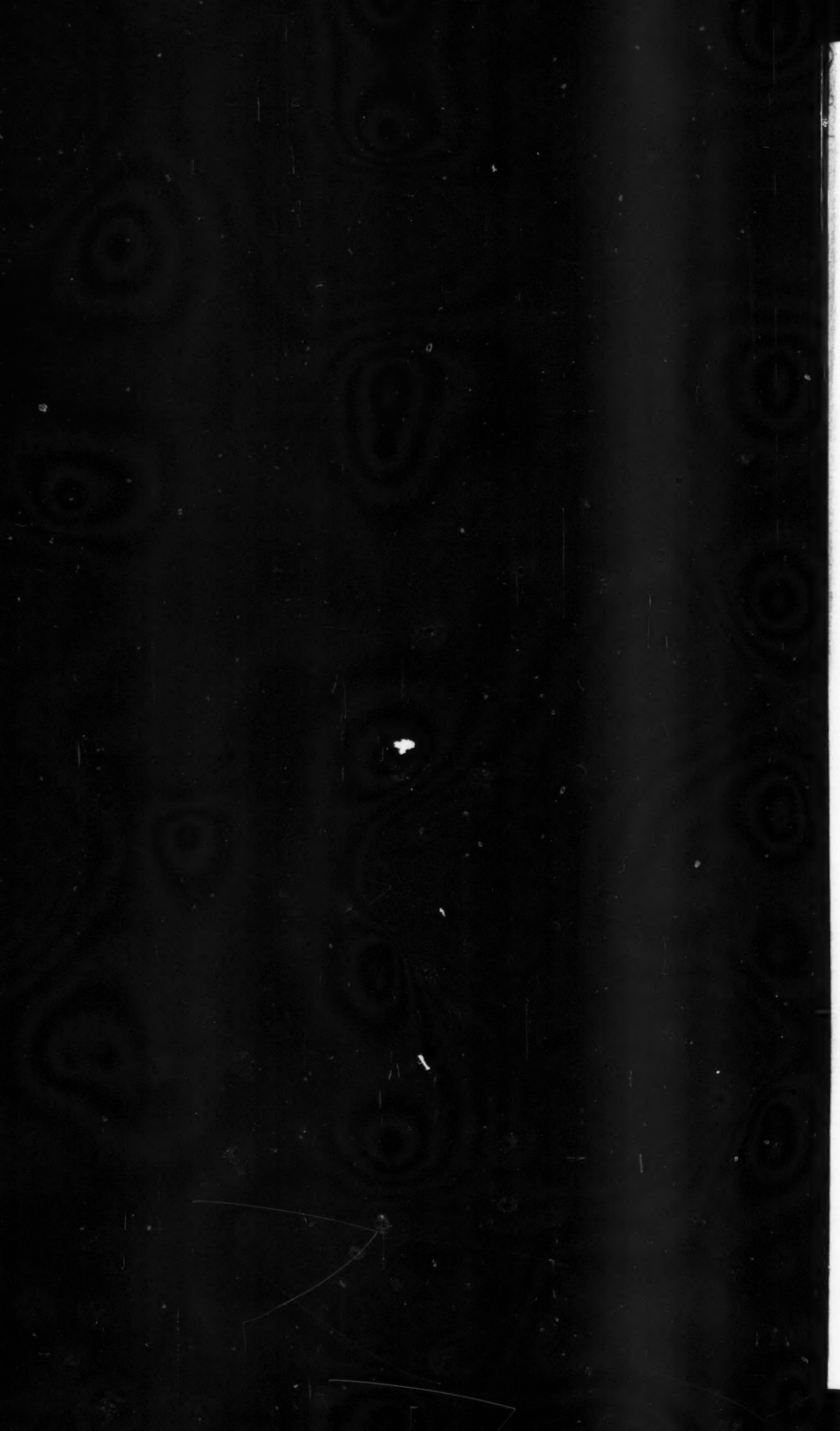
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THE GENERA MIDOTIS, IONOMIDOTIS AND CORDIERITES.

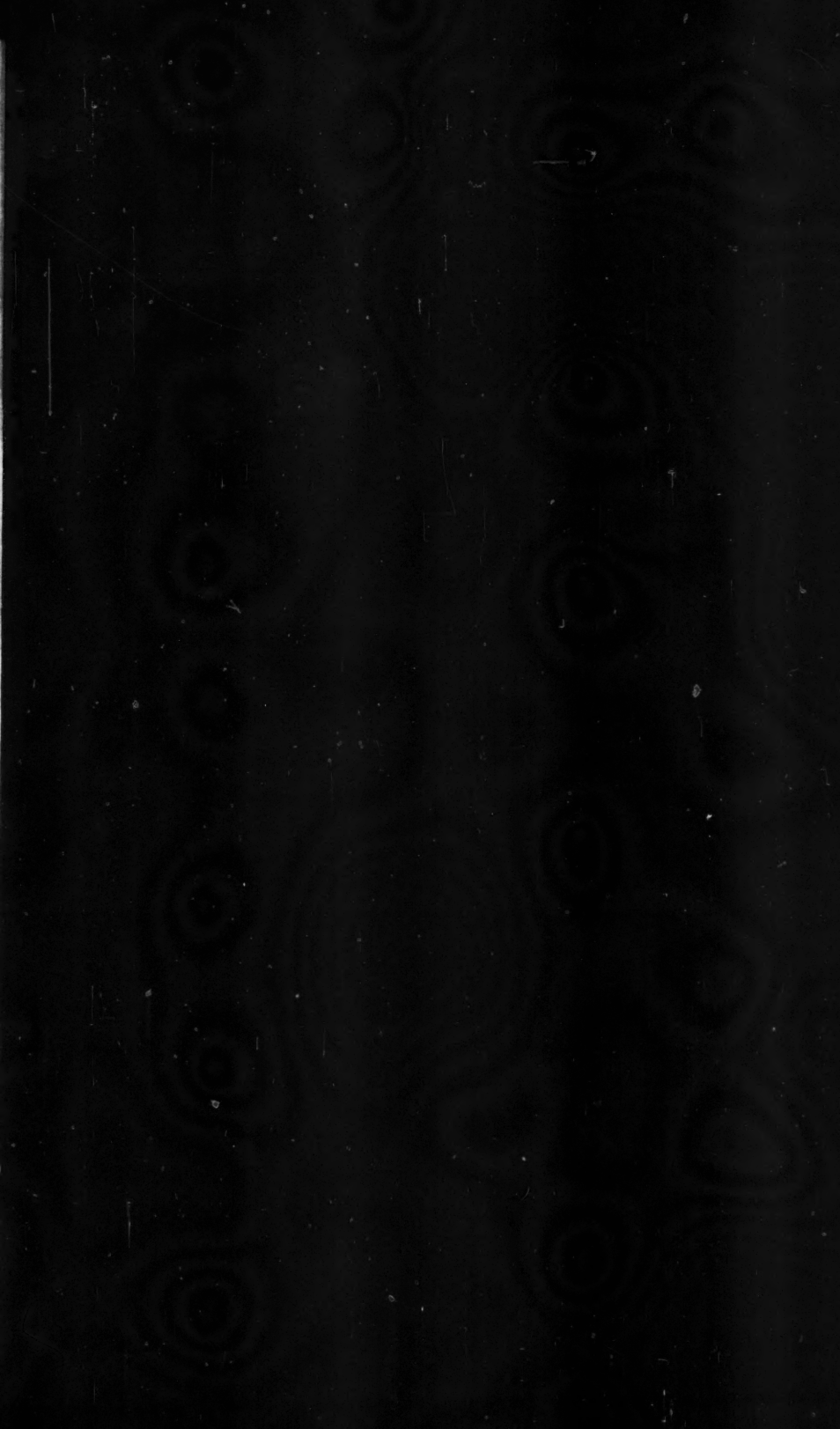
BY ELIAS J. DURAND.

WITH TWO PLATES.

*(Continued from page 3 of cover.)*

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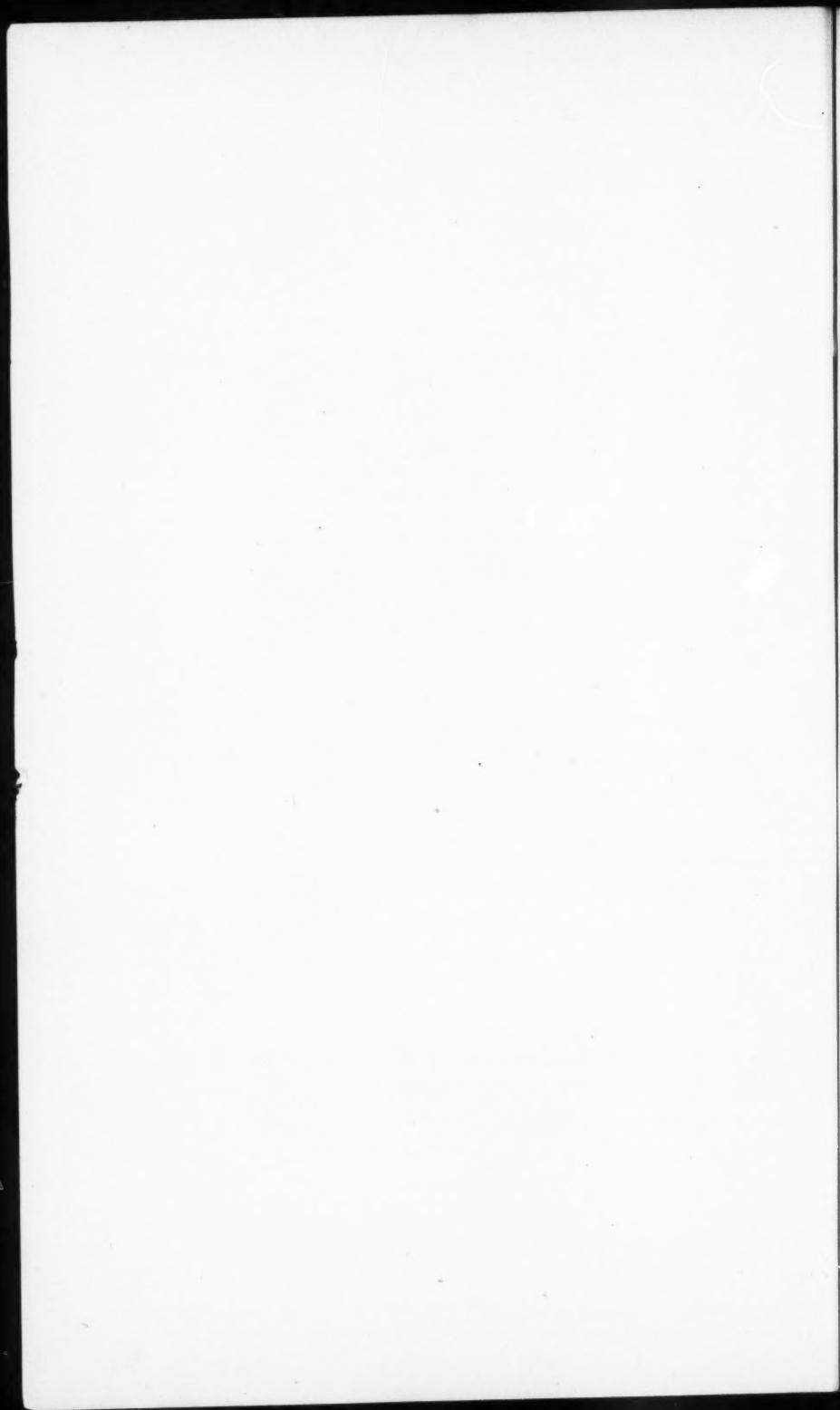
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THE GENERA MIDOTIS, IONOMIDOTIS AND CORDIERITES.

BY ELIAS J. DURAND.

WITH TWO PLATES.





## THE GENERA MIDOTIS, IONOMIDOTIS AND CORDIERITES.

BY ELIAS J. DURAND.

Received May 24, 1923.

Presented by Roland Thaxter.

NOTE. The following paper, concerning which I had had some correspondence with Professor Durand shortly before his untimely death, is here published exactly as he left it except for the addition of a few Notes, as indicated, and of two plates which have been prepared to illustrate it. *Roland Thaxter.*

To the long established genera *Midotis* Fr. and *Cordierites* Mont. have been referred, from time to time, several little understood species of discomycetous fungi, mostly from the American tropics. While both genera as originally described were monotypic, either the type species were so rare, or so imperfectly described, or the type specimens are either missing entirely, or have been so inaccessible to those interested, that their nature and relationships have been involved in obscurity. The more recently described species are no better known, having been described from single collections in each case, and most inadequately characterized. Writers have referred them sometimes to one genus, sometimes to another, as their judgment, based always on too little information, seemed to dictate.

During the past twenty-five years several specimens have been sent to the writer by their collectors, or have been consulted in herbaria, which were evidently related to the genera under consideration, and which seemed to throw some light on their structure and relationship. That additional material needs to be consulted is only too evident to the writer. However, it seems to be worth while to put in form the information already at hand in the hope of adding something to our knowledge of these little-known plants.

### MIDOTIS Fr.

The genus *Midotis* was first published by Fries, in 1825,<sup>1</sup> as a genus of *Auricularini*, in the following terms:

"Hymenium laevisimum (exsiccatione rimosum) a pileo discretum & secedens. Asci immersi, sporidiis uniserialibus.

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<sup>1</sup> Syst. Orb. Veg. 363. 1825.

Ab Auricularia exacte differt ut Boletus a Polyporo. Species unica *Pleuropus*."

No species was mentioned, the terms *Mesopus*, *Pleuropus*, *Apus* etc., having been used by the author as descriptive, tribal headings rather than as the names of species, and having reference solely to the position of the stem, which in *Pleuropus* was lateral. Neither was there anything about the description to furnish more than the most general clue to the nature of the fungus. About all that was suggested was that the plant was an ascomycete somewhat resembling *Auricularia* in form.

A little additional light was thrown on the subject in 1828,<sup>2</sup> when the same author declared the hymenium to be inferior and *Peziza*-like. The only known species was described as *Midotis Lingua*, from material collected in Switzerland by Schleicher. It seems to have been a large plant (5 cm. high), attached by a short, lateral stipe, and was compared to a resupinate *Otidea leporina*, whatever that may be. It is hard to conceive of a resupinate *Otidea* with an inferior hymenium. *Midotis Lingua* is entirely unknown to Rehm and Boudier, nor has any other student of discomycetes collected or recognized the plant. The present writer saw no specimen in the Friesian Herbarium.

In 1849, Fries<sup>3</sup> again commented on the genus as follows:

"Excipulum coriaceo-suberosum, dimidiatum, verticale, disco atro unilateraliteri ceraceo ascigero, persistente."

"This paradoxical genus appears widely remote from others, but an exotic species (*M. heteromera* Mont. \*\*\*) approaches so closely to the Dermateas, that it might be referred to the Encoelias, from which it differs as *Peziza leporina* from *P. cupularis*."

These notes convey the definite idea of an ear-shaped discomycete, much elongated on one side so as to be vertical, bearing the persistent hymenium on one surface, and differing from *Otidea* in being coriaceous rather than fleshy in texture. Of special importance is Fries's reference to a second species of *Midotis*, the *Peziza heteromera* Mont., from tropical America, from which, in the absence of specimens of *M. Lingua*, any modern conception of the genus must be derived.

Saccardo<sup>4</sup> included the genus *Midotis*, but unfortunately combined with it the little known genus *Wynnea*, of Berkeley, which Dr. Roland Thaxter<sup>5</sup> has more recently elucidated from study of fresh

<sup>2</sup> Elench. Fung. 2: 29. 1828.

<sup>3</sup> Summa Veg. Scand. 362. 1849.

<sup>4</sup> Syll. Fung. 8: 547. 1889.

<sup>5</sup> Bot. Gaz. 39: 241-247, pl. 4. 1905.

and authentic material, and shown to be a very distinct and well marked generic type.

The type material of *Peziza heteromera* Mont., collected in Guiana, by Leprieur, has not been available to the writer. However, there is a specimen from Cuba, in Cooke's herbarium, at Kew, marked "ex herb. Montagne," which may reasonably be regarded as authentic. A study of this, and certain other West Indian collections agreeing exactly with it, has convinced the writer that they represent a good generic type to which the name *Midotis* should be applied. Two other West Indian collections examined seem to be undescribed species, congeneric with *M. heteromera*. The present writer's conception of *Midotis* may be set forth as follows:

Ascomata superficial, solitary, or clustered, or several arising from a common base, spherically closed when young, then opening out, becoming vertically elongated on one side when mature, light colored; excipulum suberous or subcoriaceous, composed of interwoven hyphae which either project from the surface as very short, stout, septate pili, or are replaced by a thin cortical pseudo-parenchyma the cells of which project in groups, not becoming violet with KOH; asci cylindric clavate, opening by a pore, not blue with iodine; spores small, hyaline, continuous.

- A. Plants large, nearly sessile, externally furfuraceous, rhubarb-color, spores 8-10  $\mu$  long. .... 1. *M. heteromera*.
- A. Plants small, slenderly stipitate, spores 4-6  $\mu$  long.
  - B. Excipulum of hyphae projecting to form short, moniliform, brown pili; spores ovoid. .... 2. *M. occidentalis*.
  - B. Cortical layer of excipulum parenchymatous, brown; spores elliptic. .... 3. *M. infundibuliformis*.

1. MIDOTIS HETEROMERA (Mont.) Fr., Summa Veg. Scan. 362. 1849.

*Peziza heteromera* Mont., Ann. Sci. Nat. II. 13: 206. 1840.

*Midotis verruculosa* B. & C., Journ. Linn. Soc. Bot. 10: 370. 1868.

Ascomata solitary or several arising from a common stem-like base, irregularly elongated on one side, *Otidea*-like, tough, corky to leathery when dry, 2-3 cm. high and broad, externally verrucose, a beautiful rhubarb-color, disk reddish brown. *Excipulum* composed of closely interwoven, hyaline hyphae, remotely septate within, the external ones projecting from the surface are stouter and closely septate into cells as long as broad, with yellow walls, and aggregated in groups to form the external warts, not becoming violet with KOH. *Hymenium* about

150  $\mu$  thick. *Asci* clavate-cylindric, apex rounded, not blue with iodine, 80–90  $\times$  5  $\mu$ . *Spores* 8, uniseriate, hyaline, smooth, 2-guttulate, oblong to oblong-cymbiform, 8–10  $\times$  3.5–4  $\mu$ ; *Paraphyses* cylindric, hyaline, slightly longer than the *asci*.

On rotten wood (apparently), tropical America.

#### MATERIAL EXAMINED.

Cuba: ex herb. Montagne (K.); Wright n. 580 (K); Wright n. 663 (type of *M. verruculosa* B. & C.) (K.).

Montserrat: Blake's Mt., Jan. 8, 1907, J. A. Shafer n. 908 (NY).

In general appearance and texture this plant has much in common with the genera *Cookeina* and *Phillipsia*, but the hymenium is quite different. Unfortunately the writer has seen the plant only in the dried state in which the colors probably have changed, although the substance seems to shrink but little in drying.

*M. verruculosa* B. & C. was said by its describers to differ from *M. heteromera* "in its verrucose, not simply mealy surface, and the broader rather shorter sporidia." After careful comparison of authentic specimens the writer is unable to detect any difference even in degree between them. No "large concatenate cells" such as were noted by Massee<sup>6</sup> have been observed in the excipulum.

NOTE. In the Curtis Herbarium are two specimens; the first, labeled "Midotis verruculosa B. & C., Fung. Cub.; 705. Ad lign. mort. Cuba, C. Wright (663)," the second "Cordierites lateritia B. & C., on rotten logs, May, 1857, Cuba, coll. Wright," with a note, apparently a memorandum of Wright, "clustered, cinnamon or light brown. Has the odor of Wintergreen or Black Birch." Also a note by Farlow "Was the name Cordierites lateritia ever published? See Midotis verruculosa B. & C. in Herb. Curtis." These two seem identical, and the habit herewith reproduced on Plate I, as well as figure 1 of Plate II, are taken from the second specimen. R. T.

#### *Midotis occidentalis* Durand n. sp.

*Ascomata* small, solitary or closely gregarious, stipitate, coriaceous; *stipe* slender, terete, longitudinally striate, blackish brown, 3–7 mm. long, 1 mm. thick, expanding to form the *cup* which is vertically elongated on one side and split down to the stem on the other, 3–5 mm. long and wide, externally blackish brown, vertically striate, hymenium brownish cervinous, margin irregular. *Excipulum* composed of slender

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<sup>6</sup> Journ. Linn. Soc. Bot. 31: 467. 1896.

hyphae densely interwoven, black at the surface and immediately beneath the hymenium, the intermediate zone nearly hyaline, the superficial hyphae projecting very slightly from the surface are slender, closely septate and moniliform, not violet with KOH. *Hymenium* about  $150\ \mu$  thick, hyaline; *Asci* clavate-cylindric, apex rounded, not blue with iodine, about  $80\ \mu$  long. *Spores* 8, uniseriate, hyaline, smooth, ovate-elliptic,  $5-6 \times 3\ \mu$ . *Paraphyses* slender, hyaline, not thickened above, longer than the asci.

On a decaying log, Mabess River, Jamaica, Apr. 23, 1903, W. R. Maxon n. 1549 (D).

This material was communicated to the writer some years ago by Dr. P. L. Ricker. It so closely resembles *Cordierites Sprucei* in form, size, spores etc., that it was referred provisionally to that imperfectly described species. Subsequent comparison with authentic material, however, shows a difference in color, structure of excipulum, and reaction to KOH. It is congeneric with *M. heteromera*.

**Midotis infundibuliformis** Durand n. sp.

*Ascomata* solitary or gregarious, stipitate, 3-5 mm. high, the base of each usually surrounded by a group of minute conical or columnar young fruit bodies; *stipe* slender, 2-3 mm. long, 1 mm. thick, dark brown, furfuraceous, gradually expanding into the *cup* which is at first closed, then expanding to become cupulate, finally much elongated vertically on one side, externally cinnamon-brown, furfuraceous, usually more or less concentrically zonate near the margin, the disk griseus or brownish griseus, 2-3 mm. high and wide, often hood-shaped. *Excipulum* suberous, composed of densely interwoven hyaline hyphae, replaced by a brown cortical layer of pseudoparenchyma, the polygonal cells  $10-12\ \mu$  in diameter, with brown walls, projecting from the surface in groups, not yielding a violet solution with KOH. *Hymenium* hyaline, about  $80\ \mu$  thick. *Asci* clavate-cylindric, apex rounded, not blue with iodine,  $50-55\ \mu$  long. *Spores* 8, uniseriate, hyaline, smooth, continuous, oblong-elliptic,  $4-6 \times 2-3\ \mu$ . *Paraphyses* cylindric, hyaline, somewhat longer than the asci.

On rotting logs, Emperor Valley, Port of Spain, Trinidad, December, 1912, R. Thaxter. Type in the Farlow Herbarium, Harvard University.

This species resembles *M. occidentalis* in size and form, but differs in color, the zonate surface, structure of excipulum, thinner hymenium,

and shape of the spores. The writer is greatly indebted to Dr. Roland Thaxter for placing at his disposal this and several other unique *Midotis*-like forms described in the present paper.

NOTE. The cup in this species is not always "greatly elongated" on one side, although this asymmetry is usually characteristic. The "conical columnar young fruit bodies" referred to in the description are pycnidia, (Plate II, figure 4), which, when young, are filled with a mass of very minute, irregularly angular, brownish spores, which are subsisodiametric,  $1.5-2\ \mu$  in diameter and are discharged through a terminal pore. They are often crowded about the bases of the apothecial stalks, and become quite black; resembling the long-necked ostioles of some pyrenomycete, tapering from a somewhat swollen base to a subulate extremity, or nearly isodiametric throughout. The material was found growing gregariously on a hard decorticated log in the Emperor Valley, a part of the Botanic Garden at Port of Spain; a rich locality of native vegetation which has since been felled, burned over and effectually destroyed. R. T.

In addition to the four species already mentioned several other discomycetes have at one time or another been referred to the genus *Midotis*. Of these, *M. gigantea* (B. & C.) Sacc. and *M. macrotis* (Berk.) Sacc. are species of *Wynnea*. *M. crispata* B. & C. is a *Philipsia*. *M. regularis* C. & P.,<sup>7</sup> from Brazil, if really erumpent as described, is not a true *Midotis*. *M. Patella* Fr.,<sup>8</sup> from Mexico, may be a *Wynnea*. Neither of the two last mentioned forms have been seen by the writer, and the descriptions are too inadequate to give more than a hint as to their relationship. *M. brasiliensis* Rick.,<sup>9</sup> with its large asci and spores is probably truly Pezizaceous. No specimen has been seen. Of special interest to students of North American fungi are *M. irregularis* (L. v. S.) Cke., of the Eastern States, and *M. plicata* Phil. & Hark., of California. A careful study of authentic material of these species has convinced the writer that they represent a distinct and undescribed generic type which, with its known species, may be characterized as follows:

#### ***Ionomidotis* Durand, Nomen nov.<sup>10</sup>**

Ascomata superficial, solitary, or several arising from a common base, irregular and much elongated on one side when mature, usually violet or olive; substance thin and fragile, exuding a deep violet

<sup>7</sup> Grev. 9: 101. 1881.

<sup>8</sup> Nov. Symb. Mant. 231.

<sup>9</sup> Ann. Myc. 2: 246. 1904.

<sup>10</sup> 'ίόν (violet) + *Midotis*, referring to the violet solution with KOH.

solution with KOH; excipulum composed of interwoven hyphae, with a cortical layer of pseudoparenchyma; asci clavate-cylindric, opening by a pore, not blue with iodine; spores small, hyaline, continuous.

7 species are known as follows:

- A. Paraphyses with deciduous lanceolate tips; plants large.
  - 1. *I. irregularis*.
- A. Paraphyses without deciduous tips.
  - B. Hymenium blackish brown or blackish violet.
    - C. Blackish brown.
      - D. Spores 5-6  $\mu$ , plants large.....2. *I. Chilensis*.
      - D. Spores 15-18  $\mu$ .....3. *I. Nicaraguensis*.
    - C. Blackish violet, spores minute.
      - E. Ascomata irregularly goblet-shaped, nearly sessile.....4. *I. plicata*.
      - E. Ascomata vertical, stipe slender.....5. *I. Sprucei*.
  - B. Hymenium olivaceous.
    - F. Ascomata urceolate, externally furfuraceous; spores 10-12  $\mu$ .....6. *I. urceolata*.
    - F. Ascomata unsymmetrically discoid, externally granular; spores 7-8  $\mu$ .....7. *I. olivascens*.

### ***Ionomidotis irregularis* (L. v. S.) Durand.**

*Peziza irregularis* L. v. S., Proc. Phil. Acad. Sci., 4: 171. 1834.

*Cordierites irregularis* (L. v. S.) Cke., Bull. Buf. Acad. Sci., 3: 26. 1875.

*Peziza doratophora* E. & E., Journ. Myc., 1: 90. 1885.

*Otidia doratophora* (E. & E.), Sacc. Syll. Fung., 8: 96. 1889.

*Midotis irregularis* (L. v. S.) Cke. in Sacc. Syll. Fung., 11: 422. 1895.

Ascomata solitary or generally clustered, several arising from a common, stem-like base, up to 2 cm. long, which penetrates the substratum, at first closed then opening and expanding, becoming much elongated on one side and irregularly lobed or lacerated, up to 3 cm. long and wide, the clusters 5-7 cm. wide; externally scurfy, dark chestnut-brown, the hymenium darker or almost black. Excipulum thin (300  $\mu$ ) and fragile, slightly gelatinous, dark violet-brown, opaque, yielding a deep violet solution with KOH, composed of slender interwoven hyphae, replaced at the surface by a thin parenchymatous layer of polygonal cells 8-10  $\mu$  in diameter, projecting from the surface

in groups. *Hymenium* about  $100\ \mu$  thick. *Asci* cylindric-clavate, the apex truncate-rounded, not blue with iodine,  $50-70 \times 4-5\ \mu$ ; *Spores* 8, obliquely uniseriate or subbiserial, clavate-oblong, hyaline with a tinge of violet, continuous, smooth, 2-3-guttulate,  $8-10 \times 3-4\ \mu$ . *Paraphyses* cylindric, hyaline with a violet tint, each terminated by an abrupt, lanceolate, acute head,  $18-30 \times 3-4\ \mu$ , becoming 1-3-septate, which projects about its length beyond the hymenium and easily separates from its base.

On rotten wood and branches lying on the ground. Eastern United States.

#### MATERIAL EXAMINED.

New Hampshire: White Mts., Miss Minns (type of *Peziza doratophora*) (NY).  
Connecticut: West Haven, R. Thaxter (D.)  
New York: Sandlake, C. H. Peck (A); Lake Placid, G. F. Atkinson (D).  
Pennsylvania: Bethlehem, Schweinitz (S type) (K).  
Ohio: A. P. Morgan (D) (K) (NY).

A remarkable discomycete both in habit and microscopical characters. The flesh is exceptionally thin and so saturated with the violet pigment as to be quite opaque even in thin sections, yielding a profuse, deep violet solution on treatment with dilute KOH. The lanceolate tips of the paraphyses readily separate from their slender bases at a septum, suggesting a conidial nature. They have not been seen germinating, and it is doubtful whether they so function. Somewhat similar conidium-like tips exist in *Lachnella diplocarpa* Curr., which Massee has made the type of a new genus, *Diplocarpa*, on this account. Morgan's Ohio specimens, previously reported as *Midotis plicata*, were given the manuscript name of *Diplocarpa tinctoria* by Massee. However, this species is quite different from Currey's plant.

NOTE. This form, which I have found at Burbank, E. Tennessee as well as at West Haven, Connecticut, may reach a length of more than seven centimeters, and varies from an almost simple to a copiously branching fasciculate habit, the thin apothecia spreading outward horizontally from the sides of fallen logs, with the hymenium directed downwards; so that it might easily be mistaken for some member of the Thelephoraceae. The peculiar deciduous tips of the paraphyses become tinged with brown, the protoplasm collecting along the inner margin of the wall. The separation of these tips, which project beyond the asci, is not an abjunction; but results from breakage, and seems certainly to have no significance such as is above suggested. The spores show a small clump of protoplasm at either pole and a broad equatorial band which, in alcoholic material, has the appearance of a pseudoseptum. *R. T.*



***Ionomidotis chilensis* Durand n. sp.**

*Ascomata* solitary or cespitose, several arising from a common stem-like base, deeply cleft or lacerated to varying depths so as to resemble a broad-branched *Clavaria*, the lobes much elongated on one side, more or less vertical, ascigerous on one surface only, the cluster 2 cm. or more high and broad, very irregular and the margin fluted, at least when dry; disk black, the sterile surface brownish black, tissue thin and fragile; *Excipulum* yellowish brown when dry, blackish when wet, opaque, composed of interwoven brown hyphae, replaced at the surface by a thin cortical parenchyma of rounded or polygonal cells,  $6-8\ \mu$  in diameter, yielding a violet solution with KOH. *Hymenium* brown, opaque, about  $65\ \mu$  thick. *Asci* cylindric-clavate, apex rounded, not blue with iodine,  $40-45\ \mu$  long. *Spores* 8, biseriate, minute, hyaline, continuous, cylindric, strongly curved, ends obtuse,  $5-6 \times 1.5\ \mu$ . *Paraphyses* cylindric, the tips variably thickened, nodulose, brown, slightly longer than the asci.

On rotting wood, Corral, Chile, December, 1905, R. Thaxter. Type in the Farlow Herbarium, Harvard University.

This species looks somewhat like *I. irregularis* externally, but the paraphyses lack the deciduous, lanceolate tips so characteristic of that plant, and the spores and method of branching are different.

It at first seemed possible that this might be an undescribed species of *Peltigeromyces* A. Möll., on account of the peculiar branching and lobing, but so far as one can judge from the description the single known species of that genus is a much more regular cupulate plant, attached by the center, and not *Otidea*-like.

NOTE. Two gatherings of this peculiar form were made at Corral which differ slightly in habit. That communicated to Dr. Durand differs in the more deeply and copiously cleft or lacerated character of the margin, but in other respects the two seem to be identical. The hymenium in both is at least partly inferior. The species is distinguished microscopically from the others by the paraphyses, the tips of which may be unmodified; but are usually, sometimes very considerably and abruptly, enlarged. *R. T.*

***Ionomidotis Nicaraguensis* Durand n. sp.**

*Ascomata* closely clustered or coalesced at the base, at first closed, then opening at the apex and expanding so as to become appanate (when dry), sessile, attached at one side of the base, 1-2 cm. in diameter; externally dark ferruginous brown, verrucose, the disk blackish

brown becoming dark reddish purple when wet. *Excipulum* tough and corky when dry, corky-gelatinous when moist, composed of slender hyphae, 3-4  $\mu$  thick, closely interwoven, passing at the surface into a pseudoparenchyma of cells 10-12  $\mu$  in diameter which project in groups from the surface, yielding a violet solution with KOH. *Hymenium* about 200  $\mu$  thick. *Asci* cylindric-clavate, apex rounded, not blue with iodine, 135-150  $\times$  8  $\mu$ . *Spores* 4-6 in each ascus, obliquely uniseriate, hyaline, smooth, continuous, oblong, 15-18  $\times$  5-7  $\mu$ . *Paraphyses* slender, hyaline, slightly thickened and brownish at the tips.

On rotten logs, Volcan Mombacho, Department of Grenada, Nicaragua, 20 February, 1903, C. F. Baker no. 2500 (D).

The specimens on which the above description is based were sent to the writer many years ago, by Prof. F. S. Earle, in a batch of tropical American discomycetes. They evidently belonged to a species related to *Peziza irregularis* L. v. S., but never could be placed satisfactorily. The plants evidently do not change form much in drying. No more than six spores have been detected in any ascus.

#### ***Ionomidotis plicata* (Phil. & Hark.) Durand.**

*Midotis plicata* Phil. & Hark., Bull. Cal. Ac. Sci., 1: 24. 1884.

*Ascomata* small, clustered, or several arising from a common base which is seated on the wood, at first closed, then opening by a pore at the apex, becoming unsymmetrically goblet-shaped, resembling a miniature *Urnula craterium*, 1-2 mm. high and wide, entirely black when moist, brownish black when dry, externally granular-furfuraceous, flesh thin and dark violet-brown and opaque under the microscope. *Excipulum* composed of interwoven hyphae, passing at the surface into a thin parenchymatous cortex the cells of which project in groups to form the external granules, yielding a deep violet solution with KOH. *Hymenium* about 75-80  $\mu$  thick. *Asci* cylindric-clavate, apex rounded, not blue with iodine, 65-70  $\mu$  long. *Spores* 8, irregularly biseriate, hyaline, smooth, continuous, narrowly oblong, straight or strongly curved, 5-8  $\times$  2-3  $\mu$ . *Paraphyses* numerous, cylindric, septate, often forked, the contents pale violet-brown, the tips slightly swollen and darker.

On dead *Umbellularia californica*, Sausalito, California, Aug. 1881, no. 2743.

This species is known only from the original collection as above. While the collector's name is not given it was probably H. W. Harkness.

The description given is drawn from the material preserved in the herbarium of the California Academy of Science, for access to which the writer is indebted to Miss Alice Eastwood. The somewhat plicate hymenium mentioned in the original description is not evident in the specimens seen. How the paraphyses could have been overlooked by the describers is a mystery as they are the most conspicuous thing about the hymenium.

***Ionomidotis olivascens* Durand n. sp.**

*Ascomata* solitary or gregarious, rarely cespitose, at first closed, then opening by a pore, finally becoming discoid, nearly plain with a slightly elevated margin, 1.5–3 mm. across, entirely blackish olive, the disk with a yellowish tint, externally granular or nearly smooth, abruptly narrowed to a slender stem, 1–2 mm. high, 0.5 mm. thick, attached to one side of the cup below, so that the latter varies from merely unsymmetrical to *Otidea*-like, scarcely changing in form or color on drying. *Excipulum* composed of slender, interwoven, brown hyphae replaced by a cortical layer of brown, polygonal cells, 12–14  $\mu$  in diameter, a few of the superficial ones projecting to form the granules, yielding a deep violet solution with KOH. Hymenium 60–65  $\mu$  thick. *Asci* clavate, apices rounded, not blue with iodine, 45–50  $\mu$  long. *Spores* 8, biseriate, hyaline, smooth, continuous, straight or slightly curved, narrowly oblong, 7–8  $\times$  3  $\mu$ . *Paraphyses* cylindric-filiform, scarcely thickened above, brownish.

On rotten wood, Coconut Grove, Florida, November, 1897, R. Thaxter no. 111. Type in the Farlow Herbarium, Harvard University.

The olive hymenium of this species suggests the genus *Chlorosplenium*, but its other characters are different. The irregular, unsymmetrical ascomata call to mind *C. versiforme*, but they are smaller, tougher, less contorted than in that species, and the structure and reaction of the excipulum to KOH are quite distinct. Nevertheless, *I. olivascens* may have been described somewhere as a *Chlorosplenium* although attempts to refer it to any published species have failed.

***Ionomidotis Sprucei* (Berk.) Durand.**

*Cordierites Sprucei* Berk., in Hook. Journ. Bot., 8: 280. pl. 10, f. 5. 1856.

*Ascomata* small, solitary or closely gregarious, stipitate, entirely blackish vinaceous; stipe terete, 5 mm. long, 1 mm. thick, minutely

furfuraceous, expanding above to form the cup which is oblique, much elongated vertically on one side, split down the other to the summit of the stipe, 3-5 mm. long and wide, externally minutely furfuraceous. *Excipulum* composed of vinous-brown hyphae, closely interwoven, replaced by a cortical parenchymatous layer of polygonal cells with blackish-brown walls, 8-12  $\mu$  in diameter, the superficial ones projecting in groups making the surface rough, the whole yielding a violet solution with KOH. *Hymenium* about 125  $\mu$  thick, brown. *Asci* clavate-cylindric, apex rounded, not blue with iodine, 65  $\mu$  long. *Spores* 8, uniseriate, hyaline, smooth, continuous, ovate-elliptic, 5-6  $\times$  3  $\mu$ . Paraphyses slender, pale brown, longer than the asci, often nodulose above.

On decaying trunks, Panuré, Brazil, Spruce (NY).

The above description is drawn from two specimens in the herbarium of the New York Botanical Garden marked "*Cordierites Sprucei* Berk. Brazil (Spruce)," and which are undoubtedly parts of the original collection. In the original description the asci were reported as not seen. In the material examined the plants appear to be old, and only an occasional ascus is to be found among the numerous paraphyses. This species is clearly congeneric with the other members of the genus *Ionomidotis*, and appears to have little in common with Montagne's *Cordierites guienensis*, as Saccardo has already pointed out. However, Massee, in his redescriptions of Berkeley's types,<sup>11</sup> retained it in that genus, and figured the stipe as forked in a dendroid manner.

#### ***Ionomidotis urceolata* Durand n. sp.**

*Ascomata* solitary or cespitose, several arising from a common, stroma-like base seated on the bare wood or occupying cracks in the bark, at first closed, then opening by a pore at the apex, becoming urceolate, the margin incurved, either regular, or in some cases, split down one side and *Otidea*-like, when wet entirely dark violet-brown, the exterior brown and the disk olive when dry, 1-2 mm. high and wide. *Excipulum* composed of slender, interwoven, pale brown hyphae, replaced by a cortical layer of pseudoparenchyma of polygonal cells, 8-10  $\mu$  in diameter, with dark brown walls, which project in groups to form the lumps on the surface, the whole yielding a deep violet solution with KOH. *Hymenium* 100-120  $\mu$  thick. *Asci* narrowly

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<sup>11</sup> Journ. Linn. Soc. 31: 466, pl. 18, f. 4-5. 1896.

clavate, apices rounded, not blue with iodine,  $85-90 \times 5-7 \mu$ . Spores 8, obliquely uniseriate, hyaline, smooth, continuous, 1-2-guttulate, narrowly oblong, ends rounded, straight or curved,  $10-12 \times 3-4 \mu$ . Paraphyses very slender, hyaline, cylindric, longer than the asci, scarcely thickened at the tips.

On rotten wood, Palm Beach, Florida, December, 1897, R. Thaxter no. 110. Type in the Farlow Herbarium, Harvard University.

The ascomata are about the size of those of *I. plicata*, but differ in their more regular form, their color, more furfuraceous exterior and smaller spores. The species is evidently related to the imperfectly described *Midotis regularis* Cke. & Phil., but differs in color of disk, at least.

## DESCRIPTION OF PLATE I.

NOTE. These figures have been photographed at Cornell University through the kindness of Professor Fitzpatrick, and are about the natural size, as reproduced, of the dried material. Unfortunately all the apothecia of *Midotis infundibuliformis* were broken off in transit before the photograph was made, so that only a few pycnidia and broken bases of apothecia are visible. For the general habit of the fungus, reference should be made to figure 2, of Plate II.

*Midotis heteromera* (Mont.) Fries. Young and mature apothecia ex Herb. Curtis sub "*Cordierites lateritia* B. & C."

*Midotis infundibuliformis* Durand. The apothecia broken, only their bases and pycnidia remaining. See Plate II, figure 2.

*Ionomidotis irregularis* (L. v. S.) Durand. Left hand figure seen from below, showing surface of hymenium: right hand figure showing upper surface. Material collected at West Haven, Connecticut.

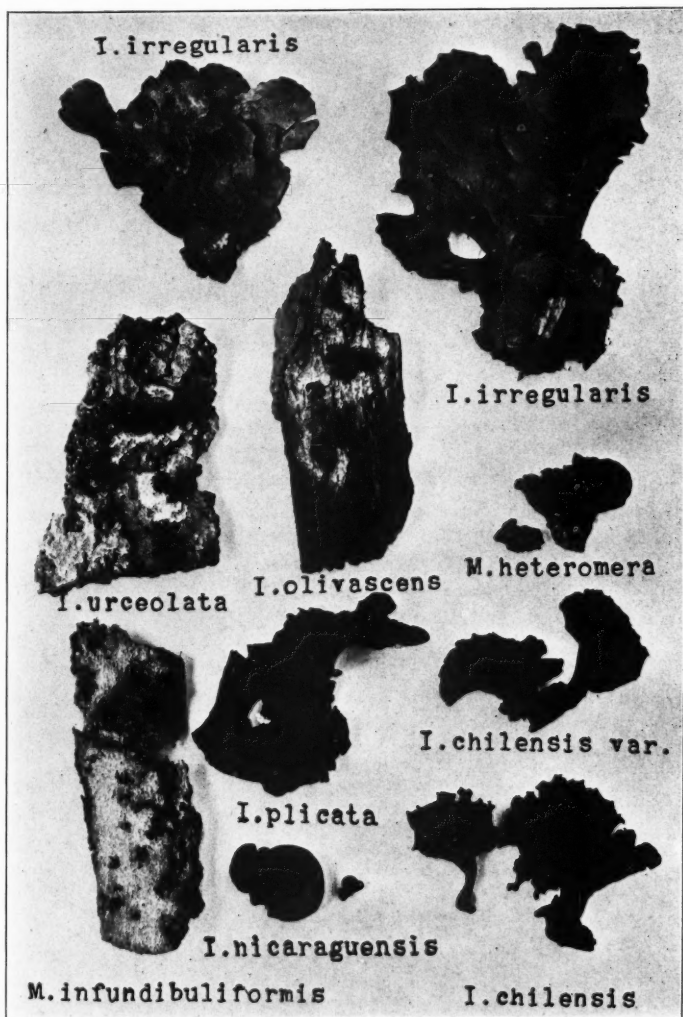
*Ionomidotis urceolata* Durand. Type specimen from Palm Beach, Florida.

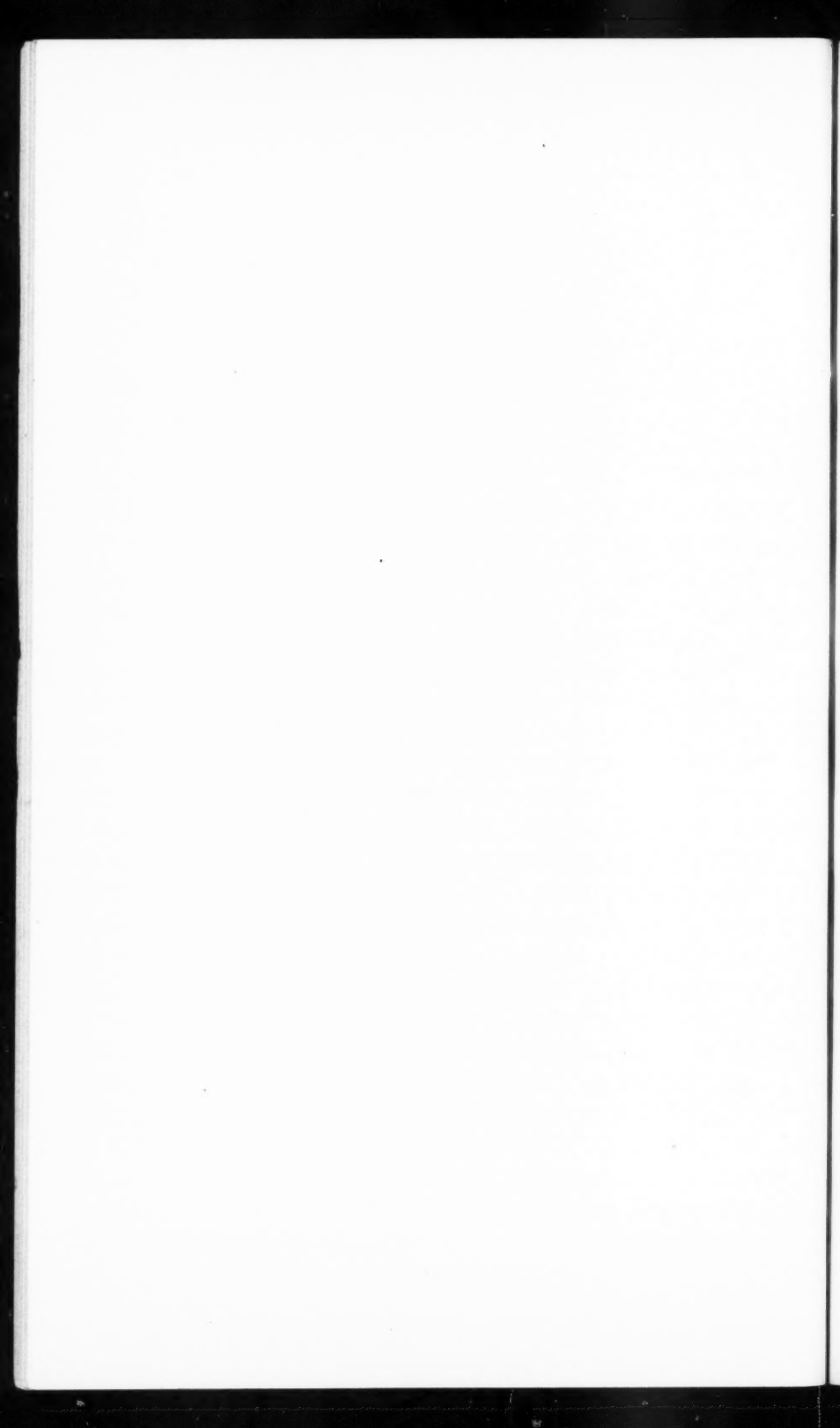
*Ionomidotis olivascens* Durand. Type material from Cocanut Grove, Florida.

*Ionomidotis plicata* (Phil. & Hark.) Durand. Part of original gathering from California in Herb. Durand.

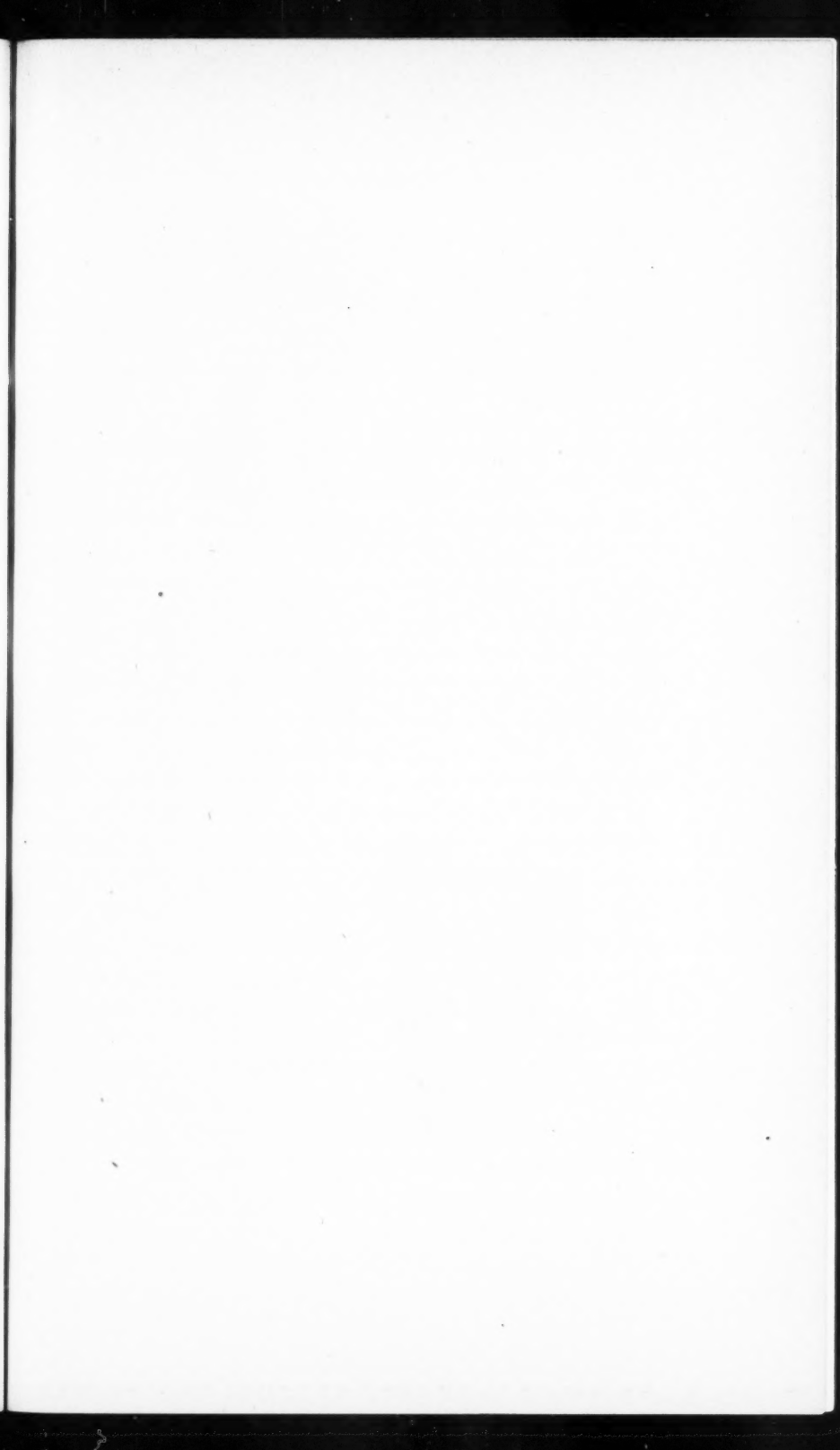
*Ionomidotis nicaraguensis* Durand. Type material in Herb. Durand.

*Ionomidotis chilensis* Durand. Lower figure typical form from original gathering at Corral, Chile. Upper figure a less lacerate and fluted form from same locality.









## DESCRIPTION OF PLATE II.

NOTE. The figures of spores, asci and paraphyses were drawn with Leitz water immersion and No. 4 ocular in all cases. Figure 5 was drawn natural size from fresh material. Figures 2 and 4 were outlined with Zeiss a \* obj. and oc. 4. The linear dimensions of the original drawings have been reduced somewhat less than a third in reproduction.

*Midotis heteromera* (Mont.) Fres.

Fig. 1. Ascus from specimen in Herb. Curtis labeled *Cordierites lateritia* B. & C.

*Midotis infundibuliformis* Durand.

Fig. 2. General habit, side and front views of dried material; the zonation, which is often hardly visible, somewhat exaggerated.

Fig. 3. Asci and paraphysis.

Fig. 4. Two pycnidia, one discharging spores shown at right enlarged, and between them the broken stalk of an apothecium. Type material from Trinidad, B. W. I., dry.

*Ionomidotis irregularis* (L. v. S.) Durand.

Fig. 5. Habit drawn natural size from fresh material collected at New Haven, Connecticut; here reduced about one third.

Fig. 6. Ascus and paraphyses with one of the separable tips of the latter.

*Ionomidotis chilensis* Durand.

Fig. 7. Ascus, spores and paraphyses, showing variations in tips of latter.

*Ionomidotis nicaraguensis* Durand.

Fig. 8. Ascus and paraphyses from type.

*Ionomidotis plicata* (Phil. & Hark.) Durand.

Fig. 9. Ascus, spores and paraphyses from original material.

*Ionomidotis olivascens* Durand.

Fig. 10. Ascus and paraphyses from type.

*Ionomidotis Sprucei* (Berk.) Durand.

Fig. 11. Asci and paraphyses. Original material from Herb. N. Y. Bot. Garden, in Herb. Durand.

*Ionomidotis urceolatus* Durand.

Fig. 12. Ascus and paraphysis from type.

